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THE NORTH AMERICAN SPECIES OF *SYSTASIS* WALKER (HYMENOPTERA: PTEROMALIDAE)

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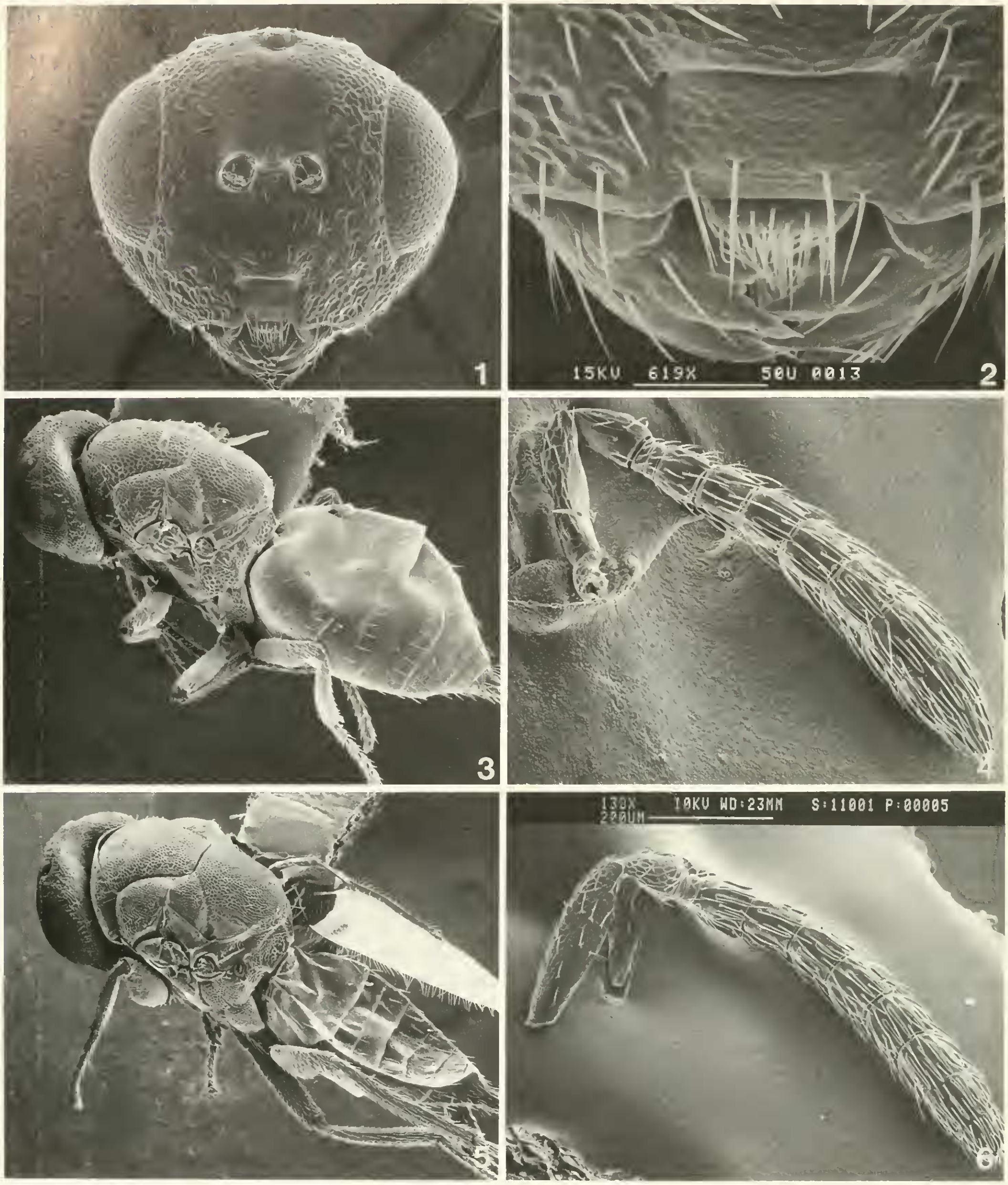
Abstract.—The nearctic species of *Systasis* Walker are reviewed. These include two holarctic species, *S. encyrtoides* Walker and *S. parvula* Walker, and three new nearctic species—***S. aquila,*** n. sp., ***S. hansoni,*** n. sp., and ***S. tena,*** n. sp. A summary of the biology and distribution for the genus and for each species is presented.

Key Words: Systasis, Semiotellus, Pteromalidae, Ormocerinae, Cecidomyiidae, gall, blueberry, biology, new species

Systasis Walker, 1834, and *Semiotellus* Westwood, 1839, were placed together in a new tribe, the Systasini (Ormocerinae), by Bouček (1988). Systasini is defined on the basis of reduction in the number of antennal segments to 12 with at least the two basal flagellar segments anelliform (Figs. 4, 6, 8–11), reduction of the number of teeth on each mandible to 3 (Fig. 2), and the uniquely structured clypeus—quadrate, nearly flat, with the anterior margin nearly straight across, and with deep anterior tentorial pits in the dorsolateral corners (Figs 1, 2). Two other unusual characters present in most species of these two genera and which need more study of their distribution are 1) the tendency of the mesepisternum to be nonmetallic, varying from almost black to dull yellowish brown depending on the species, and 2) the presence of a narrow membranous fovea basally on the dorsolateral corner of the gaster. *Systasis* and *Semiotellus* are very similar genera, and if the morphological variation found in the Nearctic species described herein is taken into account, *Systasis* species are distinguished from those of *Semiotellus* only in having 1) the speculum of the upper surface of the wing extending down to the stigmal vein, making the line of strong setae on the ventral side of the wing membrane just posterior to the marginal vein easily visible and 2) the free anterior margin of the clypeus nearly straight across (Fig. 2). *Semiotellus* species have the dorsal surface of the fore wing setose posterior to the marginal vein and the free anterior margin of the clypeus truncate. It is probable that these two genera will someday be regarded as subgenera of *Systasis* once a worldwide survey of the species is completed.

Systasis was originally created for the species *S. encyrtoides* Walker and *S. tenuicornis* Walker. Current authors recognize eight additional palearctic species—*S. acuta* (Fonscolombe), *S. annulipes* (Walker), *S. angustula* Graham, *S. basiflava* Graham, *S. ephedrae* Dzhanokmen, *S. longula* Bouček, *S. parvula* Thomson, and *S. tenuicornis* Walker; four Oriental species—*S. cenchrivora* Farooqi & Menon, *S. dalbergiae* Mani, *S. dasyneurae* Mani (key to these three species in Farooqi and Menon 1972), and *S. vischnu* (Motschulsky); 21 Australian species—*S. australiensis* (Girault), *S. cecidomyiae* (Ashmead), *S. cecili* Girault, *S. cer-*



Figs. 1–6. 1–4, *Systasis parvula,* female. 1, Head, anterior view. 2, Clypeus. 3. Whole body. 4. Antenna. 5–6, *Systasis aquila,* female. 5, Whole body. 6, Antenna.

nus (Walker), *S. dice* (Walker), *S. doddi* (Girault), *S. euctemon* (Walker), *S. flindersiae* Girault, *S. graminis* (Cameron), *S. grotiusi* Girault, *S. henrici* Girault, *S. horridula* (Girault), *S. insularis* Dodd & Girault, *S. keatsi* Girault, *S. lelex* (Walker), *S. merula* (Walker), *S. persimilis* (Dodd & Girault), *S. punctativertex* Girault, *S. seposita* Girault, *S. varipes* Girault, and *S. viridis* (Girault); and three Ethiopian species—*S. afra* Masi, *S. coerulea* Delucchi, and *S. guierae* (Risbec). There are no described species from the

Neotropical Region, and based on collections I have examined, they do not seem to occur there.

The latest catalog of nearctic Pteromalidae (Burks 1979) lists two species for North America—*S. encyrtoides* and *S. diplosidis* Eckel. The latter species was transferred to *Melancistrus* Graham (Heydon and Bouček 1992). The palearctic species *S. parvula* Thomson is reported from the New World for the first time herein, and three new nearctic species are described—*S. aquila*, n. sp., *S. hansoni*, n. sp., and *S. tena*, n. sp.

Terminology in this paper generally follows that of Graham (1969), except that genal concavity is used instead of genal hollow and club is used instead of clava. In addition, the gastral tergites are numbered T1–T7 beginning with the first tergite after the petiole. The following abbreviations are used: the median ocellar diameter is MOD, the ocellar-ocular distance is OOL, the posterior ocellar distance is POL, the lateral ocellar distance is LOL, the multiporous plate sensilla are MPP sensilla, the lower ocular line is LOcL, and the antennal funicular segments are F1 through F6. The units of measurement given in the descriptions can be converted to millimeters by multiplying by 0.02. The acronyms for the museums from which material was borrowed are listed in the acknowledgments section.

Systasis Walker

Systasis Walker, 1834: 288, 296 (Type species: *Systasis encyrtoides* Walker; Westwood 1840: 70 designation). Thomson, 1876: 193, 203. Ashmead, 1904: 274, 275. Schmiedeknecht, 1909: 275, 276, 280. Girault, 1915: 86. Nikol'skaya, 1952: 240. Bouček, 1955: 324–327. Peck, 1963: 644. Peck *et al.*, 1964: 33. Graham, 1969: 257–263. Bouček 1976: 11. Dzhanokmen, 1978: 102, 112. Bouček, 1988: 221, 310–312, 386. Mani, 1989: 539, 540. Bouček and Rasplus, 1991: 106.

Paruriella Girault, 1913a: 308; 1913b: 107 (Type species: *Paruriella australiensis* Girault; original designation). Bouček, 1988: 310–311 (synonymy).

Guieralia Risbec, 1951: 253 (Type species: *Guieralia guierae* Risbec; monotypic genus). Bouček, 1976: 11 (synonymy).

Bouček (1955) described the subgenus *Systasina* for the palearctic species *S. annulipes* (as *S. clavicornis* Bouček) because this species has a short, clavate antennae and slender body in both sexes, and apparently a four-segmented club in the males. *Systasina* was more completely characterized by Graham (1969), but because *Systasina* contained only one species, it was difficult to differentiate subgeneric from species characters. The discovery of *S.* (*Systasina*) *tena*, n. sp., and *S.* (*Systasina*) *hansoni*, n. sp., shows that subgeneric characters for *Systasina* are possibly limited to the weakly sculptured body, the elongate gaster and clavate flagellum in females, and the short scape in males. (The female body and antennal proportions for *S. tena* are unknown, however.) Other differences mentioned by Bouček (1955) and Graham (1969) are no longer valid. As in male *S.* (*Systasis*) spp., male *S. tena* and *S. hansoni* have the combined length of the flagellum and pedicel as long as or longer than the head width, and at least in *S. tena*, the flagellum parallel-sided with the basal four funicular segments elongate. In male *S. tena*, the club has a small ventral patch of micropilosity and is as long as the distal three funicular segments; in male *S. hansoni*, the club has an enlarged ventral patch of micropilosity surrounded by a well developed sulcus and so appears four-segmented. Male *S. tena* and both sexes of *S. hansoni* have the basal cell open posteriorly.

Biology. The hosts of most *Systasis* species are probably either gall-formers or inquilines, although some *Systasis* species may consume plant material as gall formers in their own right. Several of the Australian *Systasis* species have been reared—*Systasis cecidomyiae* from *Didymomyia tiliacea* (Bremi) (= *Cecidomyia frauenfeldti*) (Cecidomyiidae), *S. flindersiae* from galls on *Flindersia* (Rutaceae), *S. graminis* from seeds of *Panicum* sp. (Poaceae), and *S. lelex* from horn galls on iron-bark eucalyptus and galls on spotted gum (all records from Bouček 1988). The palearctic species *Systasis angustula* has been recovered from *Kiefferia pimpinellae* (F. Loew) (Cecidomyiidae) and *Putoniella marsupialis* (F. Loew) (Cecidomyiidae). Rearing records of *S. encyrtoides* from the Old World include Cecidomyiidae in the genera *Contarinia* Rondani, *Dasyneura* Saunders, and *Stenodiplosis* Reuter (Anonymous 1965, Anonymous 1966, Böhm 1954, Graham 1969, Manniger 1940, Rubin 1965, Selivanova 1948); Agromyzidae in seeds (Graham 1969); two Tortricidae (Anonymous 1963 and Anonymous 1965, but see Graham 1969); and *Apion compactum* Desbrochers des Loges (Curculionidae) from broom (Hoffman 1958: 1561). Two of the Oriental species have also been reared from Cecidomyiidae. *Systasis dasyneurae* is recorded from *Dasyneura lini* Barnes (Ahmad 1939) and *S. dalbergiae* from two species on *Dalbergia sissoo* Roxburgh (Fabaceae)—*Contarinia dalbergiae* Mani (Mani 1942, Bouček *et al.* 1978, Mani 1989, and possibly Gangwar and Prasad 1984) and *Erosomyia indica* Grover (Grover 1986 and Grover 1987). Unidentified Indian *Systasis* species are also reported, one from the *Noorda moringae* Tams (Pyralidae) (Cherian and Basheer 1939), and four others from the Cecidomyiidae species *Asphondylia sesami* Felt (Mathur and Verma 1973), *Contarinia* sp. on *Jasminum sambac* Ait. (Oleaceae) (David, *et al.* 1990), *Dasyneura amaramanjarae* on mango (Anacardiaceae) (Grover 1986), and *Phyllodiplosis* sp. on *Zizyphus jujuba* Tamk. (Rhamnaceae) (Tiwari 1975). The Ethiopian species, *Systasis guierae*, was reared from a gall on *Guiera senegalensis* Lam. (Combretaceae) (Risbec 1951). *Guiera senegalensis* is an African shrub on which walnut-sized galls, caused by *Vuilletia howardi* (Vuillet) (Phlaeothripidae), form on young shoots (Bradley 1969). These galls are home to a number of inquilines in the orders Thysanoptera and Lepidoptera (Bradley 1969, Pitkin and Mound 1973), so the exact host needs clarification. The type series for the new nearctic species, *S. aquila*, was collected in association with bud galls on *Vaccinium corymbosum* L. (Ericaceae), and *Lyonia ligustrina* (L.) DC. (Ericaceae). *Systasis cenchivora* is phytophagous on the seeds of *Cenchrus ciliaris* Linnaeus and *C. setigerus* Vahl. (Poaceae) (Wadhi and Verma 1970 and Farooqi and Menon 1972). As far as is known, those *Systasis* species on cecidomyiids are always external parasites on the larval stages of their hosts.

KEY TO NEARCTIC *SYSTASIS* WALKER

1. Body sculpturing weak, vertex and metapleuron nearly smooth. Male with scape not quite reaching median ocellus in anterior view 2
– Body distinctly alveolate, vertex and metapleuron with distinct raised sculpture (Figs. 3, 5). Male with scape reaching at least to median ocellus 3
2. Male with mesepisternum and tibiae metallic blue. Terminal segment of club with large patch of micropilosity (Fig. 10). Fore wing with about 15 or more admarginal setae .... *hansoni*, n. sp.
– Male with mesepisternum and tibiae weakly metallic. Terminal segment of club with minute patch of micropilosity (Fig. 11). Fore wing with about 10 admarginal setae. (Female unknown) .... *tena*, n. sp.
3. Body color olive green to black. Scape pale and nonmetallic. Female with eye height 2.0 or more times malar distance; male eye height 2.2 or more times malar distance .... *aquila*, n. sp.
– Body color green or blue. Scape dark brown or black, with distinct metallic reflections or wholly metallic. Female with eye height 2.0 or less times malar distance; male with eye height 2.2 or less times malar distance 4
4. Female body length 1.4–1.7 mm. Antenna with scape reaching the median ocellus; F1 half length of pedicel; club length longer than combined length of F3–5 (Figs. 4, 8). Male antenna with scape reaching vertex; combined length of pedicel and flagellum 1.0–1.1 × head width; funicular setae sparse, setal length equal to that of a funicular segment .... *parvula* Thomson
– Female body length 1.8–2.5 mm. Antenna with scape extending to or above vertex; F1 about

as long as pedicel; club length shorter than combined length of F3–5 (Fig. 9). Male antenna with scape extending above vertex; combined length of pedicel and flagellum 1.2–1.4× head length; funicular setae fairly dense, setal length half that of a funicular segment .... *encyrtoides* Walker

***Systasis* (*Systasis*) *aquila* Heydon,**
New Species
Figs. 5–6

Diagnosis.—*Systasis aquila* may be recognized by the following combination of characters: 1.* Body color greenish black or bluish black. 2.* Scape pale, nonmetallic. 3. Body sculpture coarse. 4. Female body length 1.7–2.5 mm; male body length 1.3–2.0 mm. 5. Female eye height 2.0–2.2× malar distance; male eye height 2.2–3.0× malar distance. 6. Female scape reaching median ocellus, length ~¾ eye height (range 0.72–0.82); male scape reaching just above median ocellus, length ~⅔ eye height (range 0.64–0.72). 7. Male with combined length of pedicel and flagellum 1.2× head width. 8. Female antenna with F1 about as long as pedicel, flagellum parallel-sided, width of F5 1.0–1.1× width of F1 (Fig. 6). 9. Male funicular setae length ½–⅔ the length of the funicular segments. 10. Plicae cariniform, extending ⅔ of way to anterior margin of propodeum. 11. Female gaster length 1.4–1.8× width, 0.86–0.95× the combined length of head and mesosoma (Fig. 5).

Description.—Holotype, female. Color: Body greenish black with yellow reflections on face, pleural region, T5–7; dorsellum, propodeum, T1 dark green. Antenna with scape yellow brown; flagellum black. Legs with coxa, trochanter, femur greenish black; fore tibia and tarsi yellow-brown, tibia slightly darker over mesal ½; middle, hind tibiae greenish black (yellow-brown at tips); middle and hind tarsi brownish yellow with pretarsi brown. Fore wing veins translucent brown.

Sculpture: Head, mesosoma minutely alveolate (Fig. 5); anterior aspect of head (except for strip from anterior margin of clypeus to median ocellus) with distinct piliferous punctures; sculpture of mesopleural region relatively low; middle lobe of mesoscutum and scutellum with scattered piliferous punctures; gaster alveolate, sculpture only slightly raised above body surface.

Structure: Body length 2.5 mm. Head pentagonal in anterior view, width 1.2× height (42:36), 2.1× length (42:20); eye height 1.3× length (20:15), 2.2× malar distance (20:9), length 5.0× temple length (15:3); torulus 1.5× own diameter above LOcL; ratio of MOD, OOL, POL, LOL as 3.5:5.0:13.5:6.0. Antenna (Fig. 6) with length of pedicel plus flagellum 1.0× head width (43:42); scape strongly flattened, length 3.3× greatest width (15.0:4.5); relative lengths of scape, pedicel, anelli, F1–5, club as 15.0:5.5:1.5:5.0:5.0:4.5:5.0:5.0:12.5; widths of F1, F5, club as 4.0:4.0:4.5; 3–5 MPP sensilla in single irregular row visible on each segment. Mesosoma length 1.3× width (54:41); dorsellum just shorter mesally than laterally; propodeum with median carina, posterior ½ of plicae, petiolar foramen strongly carinate; callus with six erect mesal and one reclinate lateral setae; spiracle ovate, partially beneath the metanotum. Fore wing length 2.2× width (110:50); relative lengths of submarginal, marginal, postmarginal, stigmal veins as 38.0:25.0:12.5:10.0; costal cell with single dorsal seta, with complete and partial ventral rows; basal cell bare; basal vein with row of four setae; admarginal setae in more than one row. Gaster chordate, its length 1.4× width (60:42); hind margin of T1 straight; hypopygium extending 0.37× length of gaster (22:60); lateral membranous areas on T1 large, extending posteriorly beyond basal fovea.

Allotype, male: Similar to holotype except generally paler—head, pleural region, gaster dark green; dorsum of mesosoma dark

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* Asterisk indicates unique character state among nearctic species.

blue; and flagellum brownish black. Body length 2.0 mm. Antenna with combined length of pedicel and flagellum 1.2× head width (47.5:38.0); relative lengths of scape, pedicel, anelli, F1–5, club as 13.0:5.0:1.0: 7.5:5.5:5.5:5.5:5.0:12.5; widths of F1, F5, club as 4:4:4; scape flattened, length 2.6× maximum width (13:5); 2–4 MPP sensilla in single irregular row visible per segment; setae dense, semierect, length ½ funicular segment length. Gaster ovate, length 1.2× width (38:33).

Variation.—Female body length 1.7 to 2.5 mm; male body length 1.3 to 2.0 mm. The color of the dorsum of the male mesosoma is sometimes greenish black. The costal cell may have no dorsal setae and only one ventral setal row. In about half the specimens, there is only a single row of admarginal setae.

Etymology.—The species name, derived from the Latin word *aquilus,* meaning dark colored, refers to the dark body color of this species relative to others in the genus.

Type material.—The holotype, allotype, and 8 female and 3 male paratypes were collected associated with bud galls on *Vaccinium corymbosum* L. from IV–V.1983 at Chatsworth, New Jersey (United States), by H. P. Boyd (USNM). Four other paratypes were collected as follows (CNCI, UCDC, USNM): United States. West Virginia: Cooper's Rock State Forest, 2.5 miles w. Bruceton Mills, 5.VI.1964, 1 ♂, 6.VI.1964, 1 ♂. Unknown locality: 1 ♀; on *Lyonia ligustrina* (L.) DC. bud gall, 1 ♀.

Biology.—The host(s) of *Systasis aquila* are unknown but this species has been reared in association with bud galls on *Vaccinium corymbosum* L. (Ericaceae), and *Lyonia ligustrina* (L.) DC. (Ericaceae).

Systasis (*Systasis*) *encyrtoides* Walker

Fig. 9

Systasis encyrtoides Walker, 1834: 296. Haliday, 1841–1842: v, pl. B, fig. 1. Graham, 1969: 259, 261. Bouček, 1977: 56.

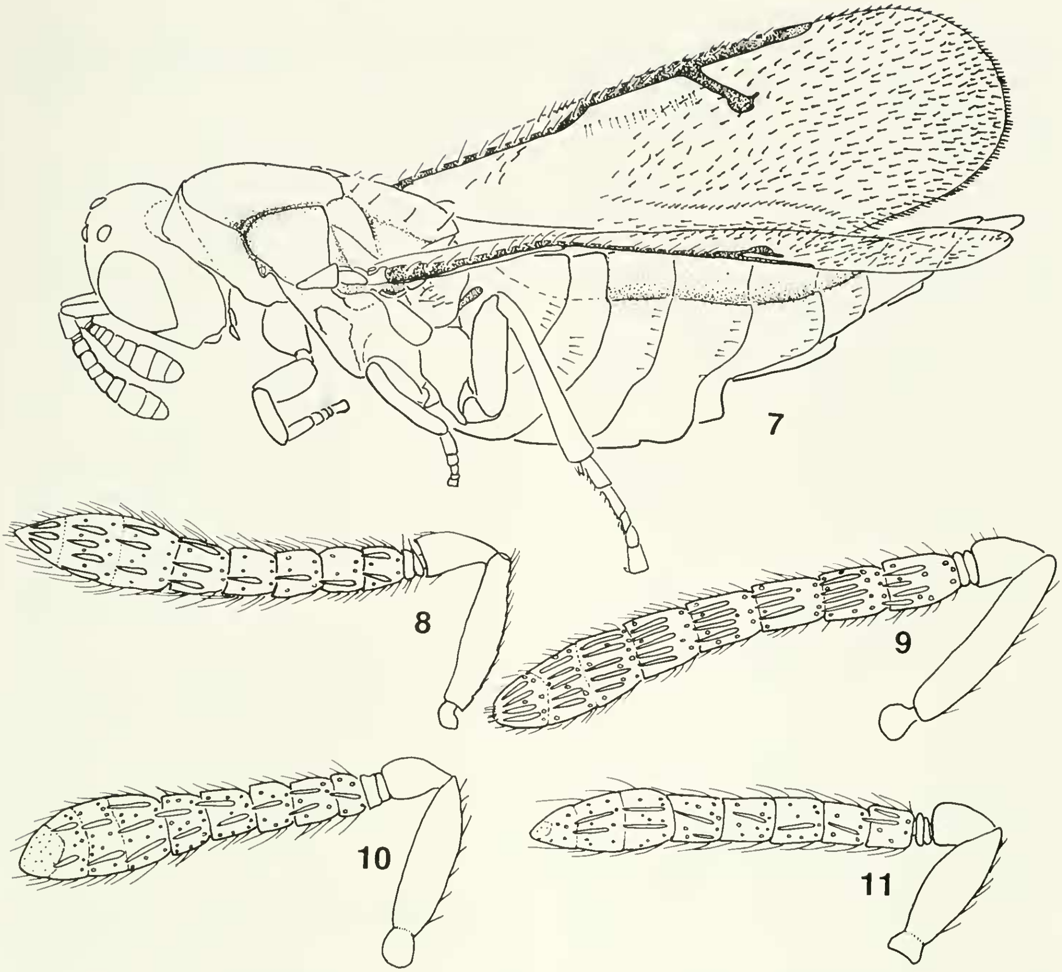
Hormocerus impletus Walker, 1872: 96. Graham, 1969: 261 (synonymy).

Systasis longicornis Thomson, 1876: 204. Graham, 1969: 261 (synonymy).

The synonymy, proposed by Graham (1969), of *Hormocerus impletus* Walker and *Systasis longicornis* Thomson with *S. encyrtoides* Walker are accepted without confirmation by the author. *Tridymus punctatus* Ratzeburg may also be a synonym of this species (Reinhard 1857 and Graham 1969), but the types are lost.

Diagnosis: Systasis encyrtoides can be recognized by the following combination of characters: 1. Body color blue or green. 2. Scape dark, weakly metallic. 3. Body sculpture coarse. 4. Female body length 1.8–2.5 mm; male body length 1.0–1.6 mm. 5. Female eye height 1.6–2.0× malar distance; male eye height 2.0–2.2× malar distance. 6.* Female scape extending above vertex, length ~¾ eye height (range 0.73–0.82); male scape extending above vertex, length about 0.7× eye height. 7.* Males with combined length of pedicel and flagellum 1.2–1.4× head width. 8. Female antenna with the length of F1 slightly shorter or equal to that of the pedicel, flagellum parallel sided (Fig. 9). 9. Male funicular setae length ½ length of funicular segments. 10. Plicae ridgelike, with a smooth crest extending ~⅔ of the way to the anterior margin of the propodeum. 11. Female gaster length 1.1–1.7× width, 0.80–0.96× the combined length of the head and mesosoma.

Material examined.—I examined 14 females and 1 male from the Nearctic Region collected as follows (CNCI, UCDC, USNM): Canada. ALBERTA: Elkwater Lake, 19.VII.1956, 1 ♀. BRITISH COLUMBIA: 15 miles e. Hope, 12.VII.1973, 1 ♀; Robeson, 12.VI.1950, 1 ♀, 21-25.VI.1947, 1 ♀, 22.VI.1947, 1 ♀; Squamish, Diamond Head Trail, 7.VIII.1953, 1 ♀, 28.VIII.1953, 1 ♀. MANITOBA: Churchill, 13.VIII.1952, 1 ♀. NORTHWEST TERRITORIES: Reindeer Depot, Mackinzie Delta, 7.VII.1948, 1 ♀;



Figs. 7–11. 7, *Systasis hansoni*, female, whole body. 8, *Systasis parvula*, female, antenna. 9. *Systasis encyrtoides*, female, antenna. 10, *Systasis hansoni*, male, antenna. 11. *Systasis tena*, male, antenna.

Yellowknife, 5.VI.1953, 1 ♀. United States. ALASKA: McKinley Hotel, 5.VII.1954, 1 ♀. COLORADO: Chicago Cr., Clear Creek Co., 2.VIII.1961, 1 ♀, along Fish Creek, 6 km s. Lake George, 7.VIII.1992, 1 ♀. MARYLAND: Adelphi, 21.V.1988, 1 ♂. OREGON: Saddleback Mountain, Lincoln Co., 3.IX.1960, 1 ♀. *Systasis encyrtoides* is common throughout Europe (Bouček 1977).

Biology.—The host(s) of *Systasis encyrtoides* in the Nearctic Region are unknown, but this species has been reared from galls of cecidomyiids or agromyzids in seeds in Europe. Old World hosts include the agromyzid *Phytomyza isais* Hering in seeds of *Odontites verna* (Bell.) Dum. (Scrophulariaceae) (Graham 1969), and the cecidomyiids *Cecidomyia crataegi* Winn. (Ghigi 1901), *Dasyneura affinis* Kieffer (Böhm 1954), *D. epilobii* (F. Loew) on *Chamaenerion angustifolium* L. (Graham, 1969); *Contarinia citri* (Rubin 1965), *C. ilicis* Kieffer (Anonymous 1965), *C. medicaginis* Kieffer (Anonymous 1961, Anonymous 1966, Bonnemaison 1968, Ferron 1964, Královic 1964, and Stavrakis and Lambrakopoulos 1971), *C. pulchripes* (Kieffer) on *Sarothamnus scoparius* (L.) Wimmer (Parnell 1963);

Stenodiplosis panici (Selivanova 1948); and pods of broom (Walker 1848 Ratzeburg 1852, Reinhard 1857, Graham 1969). There are palearctic records from the tortricids *Conchylidea implicatans* Wek. and *Tortrix viridana* L. (Anonymous 1963 and Anonymous 1965), but Graham (1969) suspects these reports may be in error. Other records include two species of weevils of the genus *Apion* that occur in pods of broom in France (Hoffman 1958), but they do not seem to parasitize this host in England (Parnell 1963). Graham (1969) suspects there may be more than one generation per year in Europe. Further details on the biology of *S. encyrtoides* are found in Ghigi (1901), Parnell (1963), Ferron (1964), and Tudor et al. (1978).

***Systasis* (*Systasis*) *hansoni* Heydon, New Species**
Figs. 7, 10

Diagnosis.—*Systasis hansoni* may be recognized by the following combination of characters: 1. Body color metallic blue or blue-green. 2. Scape blue, metallic. 3. Body sculpture weak. 4. Female body length 2.3–2.6 mm, known male body length 1.8 mm. 5. Female eye height 2.8–3.0× malar distance; male eye height 2.9× malar distance. 6. Female scape not extending to median ocellus, length between ½ and ⅔ eye height (range 0.57–64). 7. Male with combined length of pedicel and flagellum 1.0× head width. 8. Female antenna with F1 much shorter than pedicel, flagellum clavate, width of F5 1.8× width of F1. 9. Male funicular setae length about equal to length of the funicular segments. 10. Plicae weakly developed as low broad folds in propodeum, smooth crest lacking. 11. * Female gaster length 2.1–3.6× width, * 1.4–1.6× combined length of the head and mesosoma (Fig. 7).

Description.—Holotype, female. Color: Body blue except dorsum of mesosoma, gaster with yellowish green reflections, pronotum just anterior to spiracle yellowish green. Antenna with scape, pedicel blue; remainder brownish black. Legs blue except fore and middle knees and tibial tips brownish yellow, hind knees and tarsi brown. Wing veins brown.

Sculpture: Clypeus finely granulate; remainder of head weakly alveolate but anterior aspect of head with weak piliferous punctures; mesoscutum, scutellum alveolate; frenum, dorsellum, propodeum weakly alveolate; gastral terga weakly alveolate.

Structure: Body length 2.5 mm. Head nearly circular in anterior view, width 1.2× height (26.0:22.5), 1.9× length (26:14); eye height 1.3× length (14:11), 2.8× malar distance (14:5), length 3.7× temple length (11:3); torulus 1× own diameter above LOcL; ratio of MOD, OOL, POL, LOL as 3.0:3.0:7.0:3.5. Antenna with length of pedicel plus flagellum 0.83× head width (21.5:26.0); scape flattened, length 2.7× its greatest width (8:3); relative lengths of scape, pedicel, anelli, F1–5, club as 8.0:4.0:1.0:1.0:1.5:1.5–2.0:2.0:7.5; widths of F1, F5, club as 2.0:3.5:4.5; 1–2 MPP sensilla in a single row visible per segment. Mesosoma length 1.6× width (41:26); dorsellum shorter mesally than laterally; propodeum with median carina, plicae, petiolar foramen carinate; callus with 1 lateral reclinate seta, 6 mesal erect setae; spiracle round, on the anterior margin of the pronotum. Fore wing length 2.5× width (86:35); relative lengths of submarginal, marginal, postmarginal, stigmal veins as 29.0:19.0:13.0:7.5; costal cell with 5 dorsal setae, ventrally with 1 complete row and partial second row in apical ½; basal cell bare, with 1 or 2 setae on cubital vein; basal vein with narrow band of setae down its length; admarginal setae in single row of 16 setae on left fore wing, 15 setae on right. Gaster lanceolate (Fig. 7); length 2.6× width (75:29), 1.5× combined length of head and mesosoma (75.0:51.5); hind margin of T1 straight; hypopygium extending 0.29× gastral length (22:75); lateral membranous areas on T1 short.

Allotype, male: Similar to holotype except posterior ½ of T1, T2–4 dull dark purple. Body length 1.8 mm. Antenna (Fig. 10) with combined length of pedicel plus flagellum 1.0× head width (25:25); relative lengths of scape, pedicel, anelli, F1–5, club as 8.0:3.5:1.0:2.0:2.5:2.5:2.5:2.5:8.5; widths of F1, F5, club as 2:2:4; 1–2 MPP sensilla in single row visible per segment; setae reclinate, length about equal to length of a funicular segment. Gaster ovate, length 3.1× width (40:13).

Variation.—The body length of females varies from 2.3–2.5 mm. All the specimens in the type series were critical point dried so the body lengths and relative lengths of the gaster reported herein may be somewhat exaggerated. The two females with a gaster length 1.6× the combined length of the head and mesosoma have the gaster appearing noticeably expanded. The females with a gaster length 1.3–1.4× the combined length of the head and mesosoma have a very natural appearance, and living or air-dried specimens probably have their gaster of about these proportions. The color patterns of the females are generally similar to the holotype except one is noticeably more violet and two are more green. The setae of the dorsal surface of the basal cell are restricted to a single row down the basal vein except in the holotype and allotype where there is a partial second row.

Etymology.—This species is named in honor of Paul Hanson through whose collecting efforts the Oregon chalcidoid fauna is becoming better known.

Type material.—The holotype (OSUO), allotype (OSUO), and 3 female paratypes were collected on 24 June 1983, on the bluff at Pike Creek, Oregon (United States), by Paul Hanson. Three additional paratypes were collected 1 July 1986, 2 miles e. Sisters, Oregon.

Biology.—Nothing is known of the host(s) of *S. hansoni.*

Systasis (*Systasis*) *parvula* Thomson
Figs. 1–4, 8

Systasis parvula Thomson 1876: 205. Graham 1969: 259, 260, 263.

Diagnosis: Systasis parvula can be recognized by the following combination of characters: 1. The body color blue or green. 2. The scape metallic green or blue. 3. Body sculpture coarse (Fig. 3). 4. Female body length 1.4–1.7 mm; male body length 1.1–1.5 mm. 5. Female eye height 1.8–1.9× malar distance; male eye height 2.0× malar distance. 6. Female scape reaching median ocellus, length ~⅔ eye height; male scape reaching to vertex, length ~⅔ eye height. 7. Males with combined length of pedicel and flagellum 1.1× head width. 8. Female antenna with F1 about ~½ as long as the pedicel; flagellum gradually broadening, F5 1.2–2.0× the width of F1 (Figs. 4, 8). 9. Male funicular setae about as long as funicular segments. 10. Plicae ridgelike, with smooth crest lacking or extending only ½ way to anterior edge of propodeum. 11. Female gaster length 1.2–1.5× width, 0.85–0.92× combined length of head and mesosoma (Fig. 3).

Material examined.—A total of 29 females and 25 males from the Nearctic Region were collected as follows (CNCI, INHS, UCDC, USNM): United States. ILLINOIS: The South Farms of the University of Illinois, near Champaign, 26.V.1985, 3 ♀, 2 ♂; 7.VI.1983, 5 ♀, 8 ♂; 17.VI.1983, 9 ♀, 4 ♂; 18.VI.1987, 1 ♀; 28.VI.1981, 1 ♀; 6.VII.1983, 1 ♀, 8 ♂; Mississippi Palisades State Park, 2.5 miles n. Savanna, 11.VI.1983, 5 ♀, 2 ♂. INDIANA: 2 miles s. New Lisbon, 14.VII.1981, 1 ♀. VIRGINIA: Monterey, 24.VI.1964, 2 ♀, 1 ♂. WISCONSIN: Door Co., 28.VI.1961, 1 ♀. I examined a female and male from Koszalin, Poland (on loan from BMNH). *Systasis parvula* is known from Ireland, Sweden, and Czechoslovakia (Graham 1969).

Biology.—The host(s) of *S. parvula* are unknown.

***Systasis* (*Systasina*) *tena* Heydon, New Species**
Fig. 11

Diagnosis.—*Systasis tena* can be recognized by the following combination of characters: 1. Body color green. 2. Scape dark, weakly metallic. 3. Body sculpture hardly raised above body surface. 4. Body length of known male ~1.2 mm. 5. Female unknown; male eye height 3.0× malar distance. 6. Female unknown; * male scape barely reaching to median ocellus, length 0.62× eye height. 7. Males with combined length of pedicel and flagellum 1.2× head width. 8. Female unknown. 9. Male funicular setae about as long as each funicular segment. 10. Plicae low ridge; smooth crest extending ⅔ of way to anterior margin of propodeum.

Systasis tena differs from male *Systasis annulipes* (Walker), the only other *Systasis* species in the subgenus *Systasina,* in the following ways: 1. *Systasis tena* has the combined length of the head plus flagellum 1.2× the head width, all the flagellar segments elongate (Fig. 11), the club length 1.2× the length of the funiculus, the mesosoma length 1.2× its width, and the fore wing with the basal cell open posteriorly; *S. annulipes* has the combined length of the pedicel plus flagellum less than the head width, the funicular segments transverse, the length of the club equal to that of the funiculus, the mesosoma length 1.7× its width, and the basal cell closed posterior by a row of setae down the cubital vein.

Description.—Holotype, male. Color: Body green except lower epimeron, mesosternum, dorsum of T1–3 brown. Antenna with scape, pedicel dark green; remainder dark reddish brown. Legs with coxae green except hind coxa brown ventrally; femora brown, dorsum of fore femur weakly and hind femur strongly metallic; fore tibia brownish yellow with weak greenish reflections over mesal ½; middle femur brown with weak metallic coloration; hind femur brown on inner face and green on outer face; tarsi brownish yellow except pretarsi brown. Fore wing with submarginal vein brown; parastigma, remainder of venation pale brown.

Sculpture: Clypeus finely alveolate; remainder of head, mesoscutum, scutellum, T1-3 alveolate with reticulation hardly raised above body surface, face and vertex with scattered piliferous punctures; dorsellum, propodeum alveolate; T4–7 coriaceous.

Structure: Body length 1.2 mm. Head transversely ovate in anterior view, width 1.2× height (22:18), 2.0× length (22:11); eye height 1.5× length (12:9), 3.0× malar distance (12:4), length 4.5× temple length (9:2); torulus 2× own diameter above LOcL; ratio of MOD, OOL, POL, LOL as 2.5:3.0:7.0:3.0. Antenna (Fig. 11) with length of pedicel plus flagellum 1.2× head width (27:22); scape flattened, length 2.5× greatest width (7.5:3.0); relative lengths of scape, pedicel, anelli, F1-5, club as 7.5:3.5:1.0:3.0:3.0:3.0:3.0:3.0:8.0; widths of F1, F5, club as 2.0:2.0:3.5; 1–3 MPP sensilla in single row visible per segment, length about equal to that of funicular segments; funicular segments with sparse reclinate setae whose length about equals that of each funicular segment. Mesosoma length 1.3× width (26.5:20.0); dorsellum short, parallel-sided strip; propodeum crested mesally but lacking median carina, plicae extending ⅔ way to anterior margin, with weak carina along petiolar foramen, callus with 4 erect setae; spiracles circular, on anterior margin of propodeum. Fore wing length 2.0× width (59:29); relative lengths of submarginal, marginal, postmarginal, stigmal veins as 20:16:7:6; costal cell with one dorsal seta, one ventral setal row; basal cell bare; basal vein with three setae; admarginal setae in single row. Gaster ovate, length 1.7× width (25:15); lateral membranous areas of T1 not readily visible.

Female unknown.

Etymology.—The species name is derived from the Latin work *tener,* meaning delicate, refers to the delicate sculpturing of the body of *S. tena.*

Type material.—The holotype (USNM)

is a male, and was collected in stream drift of Hague Creek, 1 mile east of Hayfield, Virginia (United States), on 6 May 1940, by N. D. Richmond.

Biology.—The host(s) of *S. tena* are unknown.

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